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(19) **United States**(12) **Patent Application Publication**  
**Knight**(10) **Pub. No.: US 2021/0317706 A1**(43) **Pub. Date: Oct. 14, 2021**(54) **MULE SHOE WITH INTERNAL FLOW CONTROL**(52) **U.S. Cl.**CPC ..... **E21B 7/065** (2013.01)(71) Applicant: **Seneca Knight**, Midland, TX (US)(72) Inventor: **Seneca Knight**, Midland, TX (US)(21) Appl. No.: **16/847,977**(22) Filed: **Apr. 14, 2020****Publication Classification**(51) **Int. Cl.****E21B 7/06**

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**ABSTRACT**

A mule shoe or UBHO sub with internal flow control is provided. The device has a fluid flow controlling interior surface feature which produces a predictable fluid flow. Specifically, the device, which is an elongated hollow cylinder, has internal "rifling" to produce a swirling flow pattern within the device. This flow pattern reduces turbulence within the sub, and prevents washing out of the pin during heavy fluid flow.

